


AGREED
 Chief mechanical engineer
 AlmatyzholdaryLLP

 Zhunisbekov B.D.
 «30» 03 2023y.



APPROVED
 Director of the Institute
 «Transport Engineering»
 Chigambayev T.O.
 «30» 03 2023y.

9. CATALOG OF DISCIPLINES OF THE OPTIONAL COMPONENT

EDUCATIONAL PROGRAM

7M07148 – CARS AND ROAD EQUIPMENT

Level of education: master's degree

Training period: 2 years

Year of admission: 2023

Cycle	Component	Name of the discipline	General labor intensity		Semester	Learning Outcomes	Brief description of the discipline	Prerequisites	Postrequisites
			in academic hours	in academic credits					
1	2	3	4	5	6	7	8	9	10
DB	HF	Operation and maintenance of transport equipment	270	9	1	LO 3, LO 7	The discipline studies the main directions in the field of ensuring the operability of transport equipment, factors influencing the performance of transport equipment in extreme conditions, features of operation and maintenance of transport equipment in special production, climatic and social conditions, operation of transport equipment using alternative fuels, requirements for quality of transport equipment service and the documents regulating them, branded transport equipment service, organization of production at transport equipment service enterprises.	Undergraduate disciplines	Environmental safety of vehicles, Promising types of vehicles, NIRM
		Organization and management of TT service maintenance				LO 7	To form the necessary set of student knowledge with basic concepts, methods and a system of analysis in the field of organizing and building a system for planning the activities of a service organization in the main areas of development and long-term analysis, taking into account changing factors of the external and internal environment.		
DB	HF	Strategic management	180	6	2	LO 1	Formation of basic theoretical knowledge and basic practical skills in the field of strategic management of enterprises and organizations, strategic analysis of the external and internal environment of the company,	Bachelor's cycle database	final examination

							competitive strategy of the company and corporate management strategy. Active learning methods are used - brainstorming, group work		
		Business research				LO 1	Mastering the theory by master's students, as well as developing practical skills in business research and analytics, life cycle analysis of the development of promising technologies. The scientific and technical aspects of the project are being studied. Active teaching methods used in the discipline - individual assignment	Bachelor's cycle database	final examination
PD	HF	Environmental safety of vehicles	270	9	3	LO 6	To form the necessary set of knowledge about the environmental safety of vehicles, to develop and stimulate an active position on the negative impact of transport on the environment during their operation, to form in students a worldview that promotes a conscious attitude towards the negative impact of vehicles on the environment and humans. Within the framework of the discipline, theoretical and practical issues are considered: the current state of the vehicle, methods for ensuring the environmental safety of the vehicle; promising directions for improving the environmental safety of vehicles. The discipline uses interactive teaching methods, the case study method and the calculation and analytical method.	Competitiveness in transport, Prospective types of working bodies of the PSDM, Operation and maintenance of transport equipment	NIRM, Final certification
		Machines and tools for track work				LO 4, LO 6	The study of designs, theory and calculations of machines and tools for track work, their use in the repair and maintenance of the roadbed, ballasting and lifting of the track, cleaning of crushed stone, assembly, disassembly and laying of rail and sleeper grids, compaction and stabilization of the ballast layer, straightening and finishing of the railway track, diagnostic tools and equipment for monitoring the geometry and condition of the rail track, clearing the track from snow. The discipline uses interactive teaching methods, and the form of assessment is an oral exam.	Machines for special excavation work, Prospective types of working bodies of the PSDM, Operation and maintenance of transport equipment Basic and major undergraduate disciplines	NIRM, Final certification
PD		Requirements and ensuring the	180	6	1	LO 6	To form the necessary set of knowledge of modern vehicle designs, as well as elements affecting the safety of operation of transport equipment in accordance with the qualification characteristics of a specialist in this profile.	Basic and major undergraduate disciplines	Environmental safety of vehicles, Promising types of vehicles, NIRM

	HF	safety of vehicles					This discipline forms the level of a specialist in transport technology. The discipline examines theoretical and practical issues: those that form operational and environmental indicators, which largely determine the technical and production performance of vehicles. The discipline uses interactive teaching methods, calculation and analytical methods, and case studies.		
		Machines for special excavation work				LO 4, LO 6	The discipline outlines the main modern environmental requirements for the quality of fuels and lubricants for transport engines, the properties of liquid and gaseous fuels, and methods for their production. Oil refining products, features of obtaining more environmentally friendly fuels. Alternative fuels for internal combustion engines. The influence of the quality of fuels and lubricants for transport engines on environmental pollution, alternative types of fuels for transport engines	Basic and major undergraduate disciplines	Environmental safety of vehicles, Machines and tools for track work Prospective types of working bodies of the PSDM,
PD	HF	Competitiveness in transport	180	6	2	LO 5	To generate the necessary set of knowledge for training specialists with professional skills in the field of analysis of transport competitiveness, allowing for the appropriate and complete use of transport in a particular enterprise. Within the framework of the discipline, the following issues are studied: specific features of the organization of transportation of goods and passengers; performance of transport and forwarding services; technical impacts on rolling stock, ensuring its safe operation; development of terminal systems and transport and forwarding services; navigation technologies of the transport process. The form of control is an oral exam.	Requirements and ensuring the safety of vehicles, Promising types of vehicles	Operational reliability of vehicles, Environmental safety of vehicles
		Promising types of working bodies of SDPM				LO 4, LO 6	The discipline studies issues of research, calculation, testing and operation of promising working parts of road construction and track machines. The main methodological provisions for planning, conducting experiments and testing working parts, processing and analyzing the information received using modern mathematical methods, recording and processing equipment are also given.	Machines for special excavation work, Operation and maintenance of transport equipment	Design, calculation of road construction machines and vehicles, Machines and tools for track work
		Promising types of vehicles	180	6	2	LO 6, LO 7	Studies promising types and classification of vehicles and their units: electric vehicles, hybrid vehicles, modern types of internal combustion engines and electric motors. As well	Requirements and ensuring the safety of vehicles,	Operational reliability of vehicles, Environmental

PD	HF						as the features of their repair and maintenance, the development and implementation of new promising areas for the efficient operation of modern vehicles. This will allow the future specialist to develop and implement new promising areas for the efficient operation of the transport fleet. As part of the study of the discipline, interactive teaching methods and discussion are used.	Promising types of vehicles	safety of vehicles
		Computer-aided design systems for PMSM					LO 4, LO 6	The discipline studies the implementation of computer-aided design systems in road construction and track machines; a set of technical and software automation tools; three-dimensional modeling; basic methods of computer-aided design and standard calculations of PMSM, devices for input-output of graphic information and data preparation used to form an information image of a document, replacement of full-scale testing and prototyping with mathematical modeling, application of variant design and optimization methods.	Machines for special excavation work, Operation and maintenance of transport equipment
PD	HF	Design, calculation of road construction machines and vehicles	270	9	3		LO 4,	Competitiveness in transport, Prospective types of working bodies of the PSDM, Operation and maintenance of transport equipment	NIRM, Final certification
		Vehicle operational reliability					LO 5, LO 7	The discipline studies the following issues: operational reliability of transport equipment and vehicle components; changes in the quality of technical systems and problems of ensuring it; tasks of predicting the condition of the machine, diagnosing it, ensuring the operability of the machine under difficult operating conditions and in the event of sudden failures; analysis and selection of transport equipment parameters that ensure trouble-free operation of transport equipment. The discipline examines theoretical and practical issues: calculation and forecasting of reliability, ensuring reliability at various stages of the product life cycle, reliability monitoring and technical	Machines for special excavation work, Prospective types of working bodies of the PSDM, Operation and maintenance of transport equipment

							diagnostics, theory of restoration of machine parts, economics of reliability. The discipline uses interactive teaching methods, discussion, and group work.		
Total			1530	51					

Head of the Department «Motor vehicles and Life Safety»



Shingisov B.T.